



**Teacher Guide Notes -
A Case for the Countryside**

Design & Technology

**Suggestions for using A Case for the Countryside
Design and Technology Units.**

QCA Unit Ref

7B	Be Creative From Fleece to Fabric
8A	Built to Survive
8B	Waxing Lyrical A Sticky Business Fencing the Woodland Way Say Cheese Where There's Dough
8D	Whirring Worzel
8E	Drawing from the Trees
9A	Sign of the Times Be Seen, Be Safe
9D	H2O Flow



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Design & Technology

Bee Creative

There is a wealth of different crafts practised throughout the countryside, many having been developed over several centuries. Lip work, a simple form of basketry is an example. In this activity, construction techniques are developed through the production of an artefact using traditional methods: the manufacture of a Skep, a woven basket historically used as a beehive.

THE CONTEXT

The context focuses on developing construction techniques through the production of an artefact using traditional materials.

THE ACTIVITY

This is concerned with 'Making a Skep'. It focuses on the manufacture of a container structure using natural materials from a renewable source.

STARTING POINTS/STIMULI

- Use catalogues and photographs to show the different means of holding other materials.
- Provide examples of containers.
- A photograph of traditional skep/basketware.

FOCUSED PRACTICAL TASKS

- Identify and evaluate suitable natural construction materials.
- Demonstrate and practise weaving and other relevant construction techniques.

DESIGN AND MAKE ASSIGNMENTS

- Using models, design and make a variety of container.
- Design a container from natural raw materials which could be used as a tourist souvenir.
- Design and make a container for use in house or garden.

INVESTIGATION, DISASSEMBLY AND EVALUATION ACTIVITIES

- Evaluate the type of container and consider how well it performs its function.
- Discuss all the criteria which the product needs to satisfy.
- Look at construction techniques used.
- Identify the raw materials used in construction.

EXTENSION ACTIVITIES

- Adapt techniques to manufacture other products such as baskets or containers.

KEY EXPERIENCES

Through following the Student Activity Sheet provided, pupils will develop knowledge and understanding about:

- the importance of considering the function of their design;
- components and processes used to produce commercial products;
- use of specialist tools;
- using raw materials from renewable resources;

and develop skills and strategies in:

- construction techniques, including joining components together;
- selecting appropriate materials and equipment;
- quality control procedures;
- evaluation of products;
- costing materials, time and production processes.

KEY VOCABULARY

- Traditional techniques.
- Structural properties.
- Aesthetics.

RESOURCES

- Tools and equipment needed for skep making.
- Examples of woven products.
- Raw materials.
- Sources of information on skep/basket production.
- Student Activity Sheet

RELEVANT WEB SITES

The Guild of Straw Craftsmen - <http://www.strawcraftsmen.co.uk>
this includes links to other web sites

MANAGEMENT AND ORGANISATION OF LEARNING PROGRAMMES AND STUDY FOCUS

Designing Skills:

- identify appropriate sources of information;
- use design briefs to guide design thinking;
- develop specification for product;
- consider needs and values of intended users;
- generate design proposals that match stated design criteria;
- consider the aesthetics, function, safety, reliability of their designs;
- take account of characteristics and properties of materials when choosing them;
- explore, develop and communicate design ideas, by modelling ideas, including use of IT;
- develop a clear idea and propose an outline plan, with alternative procedures if needed;
- evaluate designs and indicate ways of improving their ideas.

Making Skills:

- use range of processes to shape and form materials;
- select materials, tools and equipment appropriate to task;
- select and use appropriate methods of shaping and forming materials accurately;
- join and combine additional materials in temporary and permanent ways;
- interconnect a variety of components to achieve functional results;

- apply a range of appropriate finishing techniques;
- develop a clear idea and propose an outline plan, with alternative procedures if needed;
- evaluate designs, testing performance against criteria;
- implement improvements identified and take on-going action to ensure products meet specifications and original intentions.

KNOWLEDGE AND UNDERSTANDING

Materials and Components

Pupils should be taught:

- to consider physical and chemical properties and relate these to the way materials are worked and used;
- that materials can be combined, processed and finished in order to create more useful properties and desired aesthetic effects.

Structures

- to recognise and use structures in their products.

Products and applications - re:

- their intended purpose;
- the choice of materials and ways in which they have been used;
- the processes used to produce them;
- the scientific principles applied;
- the views of users and manufacturers;
- a range of alternative products.

Quality - identify and use criteria - re:

- how far it meets a clear need;
- its fitness for purpose;
- whether it is an appropriate use of resources;
- its impact beyond the purpose for which it was designed.

OPPORTUNITIES FOR IT

- Modelling designs

CURRICULUM LINKS

- Art - product creation
- Business Education - costing
- Science - structural properties of variety of natural fibres
- Geography - use of natural materials from renewable source.

ASSESSMENT

When pupils are designing and making, consider to what extent they are:

- gathering information independently to help generate design ideas;
 - developing criteria for their design, taking into account appearance, function, safety, reliability and the purpose for which it is intended;
 - investigating form, function and production processes;
 - recognising user preferences;
 - taking account of the working characteristics of materials and components;
 - evaluating their work as it develops;
 - using 3D models to explore and test their design ideas;
 - using sketches and models to illustrate alternatives;
 - producing a step-by-step plan to assist in making;
 - producing plans and outlining time and resource use;
 - using methods to measure, mark and cut appropriate materials with accuracy;
 - paying attention to quality of finish and the function of the idea;
 - adapting production methods and design ideas in response to circumstances;
- using appropriate techniques to evaluate their work and suggest modifications?



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Design & Technology

Waxing Lyrical

Many of the commercial products that are available on supermarket shelves have been developed from natural products which have been used for generations. In this activity, students manufacture a wax based polish made from natural materials and compare its uses and limitation with those of modern counterparts.

THE CONTEXT

The context focuses on using products to care for other natural materials.

THE ACTIVITY

This focuses on the manufacture of a product to use on wooden furniture using only natural harvestable products and looks at its uses and limitations compared with commercially available products.

STARTING POINTS/STIMULI

- Identify and evaluate the properties of commercially available furniture polishes and cleaners.
- Examine their uses.

FOCUSED PRACTICAL TASKS

- Study relevant cleaning or polishing products, their uses and applications.
- Consider the factors necessary for the effective packaging and marketing of a product such as polish.
- Recognise and understand the health and safety documentation on chemical products.

DESIGN AND MAKE ASSIGNMENTS

- Working in groups, produce a form/forms of cleaners/polishes.
- Working in groups, enhance products with different raw materials, e.g. scent.
- Evaluate the products against each other and commercially produced products.

INVESTIGATION, DISASSEMBLY AND EVALUATION ACTIVITIES

- Through sensory evaluation, examine a range of furniture cleaning and polishing products.
- Using information supplied on packaging, identify the raw materials used in the products and the use for which they are intended.
- Identify the design criteria which make the item useful for its intended purpose.

EXTENSION ACTIVITIES

- Design and make a variety of containers to hold cleaner/polish and market.
- Examine other product lines that could be made from beeswax.

KEY EXPERIENCES

Through following the Student Activity Sheet provided, pupils will develop knowledge and understanding about:

- components and process required to produce a product;
- health and safety considerations in production and use;
- commercial considerations in producing a new product;

and develop skills and strategies in:

- evaluating ideas and their product as it develops;
- combining raw materials;
- evaluating performance of product.

KEY VOCABULARY

- Solvents
- Formulate
- Hazards
- Tools and equipment needed for polish production.
- Examples of cleaning products.
- Health and safety information.
- Raw materials.
- Sources of information on polish production.
- Student Activity Sheet

RELEVANT WEB SITES

Bee Polish - <http://www.beepolish.com>

Alternative Furniture Polish -

<http://www.care2.com/channels/solutions/home/265>

The many uses of beeswax -<http://www.esoulshine.com/beeswaxuses.htm>

Products from the hive and their uses -

http://members.tripod.com/Bee_Mann/hiveproducts.html

MANAGEMENT AND ORGANISATION OF LEARNING PROGRAMME AND STUDY FOCUS

Designing skills:

- development specification for product;
- consider needs and values of intended users;
- consider the aesthetics, function, safety, reliability of their designs;
- take account of characteristics and properties of materials when choosing them;
- prioritise and reconcile decisions on materials, production, time and costs within the proposal;
- take account of limitations presented by tools and equipment;
- develop a clear idea and propose an outline plan, with alternative procedures if needed;
- evaluate designs and indicate ways of improving their ideas.

Making skills:

- use range of processes to shape and form materials,
- select materials, tools and equipment appropriate to task,
- select and use appropriate methods of shaping and forming materials accurately,
- join and combine additional materials in temporary and permanent ways,
- make products in quantity, using techniques to ensure consistency,
- develop a clear idea and propose an outline plan, with alternative procedures if needed,
- evaluate designs, testing performance against criteria,
- implement improvements identified and take on-going action to ensure products meet specifications and original intentions.

KNOWLEDGE AND UNDERSTANDING

Materials and components

Pupils should be taught:

- to consider physical and chemical properties and relate these to the way materials are worked and used;
- that materials can be classified according to properties and behaviour;
- that materials can be combined, processed and finished in order to create more useful properties and desired aesthetic effects;
- that heat treatment and the combining of materials alter working and performance characteristics.

Products and applications - re:

- their intended purpose;
- the choice of materials and ways in which they have been used;
- the processes used to produce them;
- the scientific principles applied;
- the views of users and manufacturers;
- a range of alternative products.

Quality - Identify and use criteria - re:

- how far it meets a clear need;
- its fitness for purpose;
- whether it is an appropriate use of resources;
- its impact beyond the purpose for which it was designed.

Health and Safety - re:

- taking responsibility for recognising hazards in a range of products, activities and environments with which they are familiar;
- using appropriate information sources to access the risks, both immediate and cumulative;
- applying their knowledge and taking action to control the risks to themselves and to others.

OPPORTUNITIES FOR IT

- DTP for packaging and advertising materials
- DTP for evaluation report
- Graphics for packaging and advertising.

CURRICULUM LINKS

- Business Education - costing, promotion and advertising.
- Science - chemical properties of beeswax/other natural components, use of natural materials from renewable source.

ASSESSMENT

When pupils are designing and making, consider to what extent they are:

- gathering information independently to help generate design ideas;
- developing criteria for their design, taking into account appearance, function, safety, reliability and the purpose for which it is intended;
- investigating form, function and production processes;
- recognising user preferences;
- taking account of the working characteristics of materials and components;
- evaluating their work as it develops;
- producing plans and outlining time and resource use;
- using methods to measure, mark and cut appropriate materials with accuracy;
- adapting production methods and design ideas in response to circumstances;
- using appropriate techniques to evaluate their work and suggest modifications



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Design & Technology

A Sticky Business

A variant on 'Waxing Lyrical': in this case producing glue from natural resins.

THE CONTEXT

The context focuses on using natural products to combine and fix other materials.

THE ACTIVITY

This focuses on the manufacture of a cohesive substance using only natural harvestable products, and looks at its uses and limitations compared with commercially available products.

STARTING POINTS/STIMULI

- Identify and evaluate the properties of commercially available glues and fixatives.
- Examine their uses.
- Picture of resin exuded from tree and hardened.

FOCUSED PRACTICAL TASKS

- Working in groups, collect resin from a pine tree in school grounds or local woodland (with permission). Filter and purify collected resin.
- Working in groups, produce a glue from collected resin.
- Evaluate the potential uses of the product against commercially produced glues.

DESIGN AND MAKE ASSIGNMENTS

- Design and make resinous glue.
- Test efficiency to combine a range of materials.
- Evaluate and suggest adaptation to improve glue efficiency. Combine resin with other substances to change physical characteristics.
- Consider how your glue could be packaged and marketed.

INVESTIGATION, DISASSEMBLY AND EVALUATION ACTIVITIES

- Through sensory evaluation, examine a range of glue products.
- Using information supplied on packaging, identify the raw materials used in the products and the use for which they are intended.
- Identify the design criteria which make the item useful for its purpose.
- Identify natural sources of glue components.

EXTENSION ACTIVITIES

- Design and make a variety of containers using only natural, harvestable products.
- Investigate properties of containers with reference to, for example, waterproofing.

KEY EXPERIENCES

Through following the Student Activity Sheet provided, pupils will develop knowledge and understanding about:

- components and process required to produce product;
- health and safety considerations of production and use;

and develop skills and strategies in:

- evaluating ideas and their product as it develops;
- combining raw materials;
- joining materials together.

KEY VOCABULARY

- Cohesion
- Materials properties

RESOURCES

- Tools and equipment needed for glue making.
- Examples of glue products.
- Health and Safety information.
- Raw materials.
- Sources of information on glue production.
- Student Activity Sheet

RESOURCES

Types of Amber, Copal and Resin -

<http://www.gplatt.demon.co.uk/typesof.htm>

Plant Oleoresins - <http://www.fao.org/docrep/x5326e/x5326e0a.htm>

MANAGEMENT AND ORGANISATION OF LEARNING PROGRAMME AND STUDY FOCUS

Designing skills:

- identify appropriate sources of information;
- use design briefs to guide design thinking;
- develop specification for product;
- consider needs and values of intended users;
- consider the aesthetics, function, safety, reliability of their designs;
- take account of characteristics and properties of materials when choosing them;
- take account of limitations presented by tools and equipment;
- develop a clear idea and propose an outline plan, with alternative procedures if needed.
- evaluate designs and indicate ways of improving their ideas.

Making skills:

- select materials, tools and equipment appropriate to the task;
- join and combine additional materials in temporary and permanent ways;
- apply a range of appropriate finishing techniques;
- make products in quantity, using techniques to ensure consistency;
- evaluate designs, testing performance against criteria;
- implement improvements identified and take on-going action to ensure products meet specifications and original intentions.

KNOWLEDGE AND UNDERSTANDING

Materials and components

Pupils should be taught:

- to consider physical and chemical properties and relate these to the way materials are worked and used;
- that materials can be combined, processed and finished in order to create more useful properties and desired aesthetic effects;
- heat treatment and the combining of materials alter working performance characteristics.

Products and application - re:

- their intended purpose;
- the choice of materials and ways in which they have been used;
- the scientific principles applied;
- the views of users and manufacturers;
- a range of alternative products.

Quality - identify and use criteria - re:

- how far it meets a clear need;
- its fitness for purpose;
- whether it is an appropriate use of resources;
- its impact beyond the purpose for which it was designed.

Health and Safety - re:

- taking responsibility for recognising hazards in a range of products, activities and environment with which they are familiar;
- applying their knowledge and taking action to control the risks to themselves and to others.

OPPORTUNITIES FOR IT

- DTP for packaging and advertising materials
- Database for evaluating report/test results.
- Graphics for packaging and advertising.

CURRICULUM LINKS

- Science
- Geography
- History
- Art
- Business Education

ASSESSMENT

When pupils are designing and making, consider to what extent they are:

- gathering information independently to help generate design ideas;
- developing criteria for their design, taking into account appearance, function, safety, reliability, and the purpose for which it is intended;
- taking account of the working characteristics of materials and components;
- evaluating their work as it develops;
- producing a step-by-step plan to assist in making;
- using methods to measure, mark and cut appropriate materials with accuracy;
- adapting production methods and design ideas in response to circumstance;
- using appropriate techniques to evaluate their work and suggest modification.



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Design & Technology

Drawing from the Trees

Charcoal has been an important product of our woodlands throughout the ages. Its uses have varied from generating heat for the first furnaces to acting as filters in chemical warfare protective clothing. Within this activity students have the opportunity to explore the various production techniques and uses of charcoal, and to manufacture artists' charcoal on a small scale.

THE CONTEXT

The context focus on the home production of a commercially available product, using traditional methods.

THE ACTIVITY

This focuses on the production and use of types of charcoal and the different types of commercially produced alternatives.

STARTING POINTS/STIMULI

- Session looking at the different types of charcoal available commercially and what each type is used for: artists, briquettes and lumpwood for barbecues etc.
- Show video section of charcoal manufacture.
- Photographs showing range of products.

FOCUSED PRACTICAL TASKS

- Working in groups, collect plant material from school grounds or local woodlands (with permission);
- Working in groups, produce charcoal from collected material.
- Evaluate the potential uses of the product against commercially produced charcoal.

DESIGN AND MAKE ASSIGNMENTS

- Working in groups, devise and construct a small scale batch production plant to produce different forms of charcoal from the basic information provided.
- Working in groups, produce artists' charcoal from different raw materials, i.e. wood types.
- Evaluate the products against each other and commercially produced artists' charcoal.
- Produce packaging for artists' charcoal.

INVESTIGATION, DISASSEMBLY AND EVALUATION ACTIVITIES

- Through sensory evaluation, examine a range of charcoal products.
- Using information supplied on packaging, identify the raw materials used in the products and the use for which they are intended.
- Identify the design criteria which make the item useful for its intended purpose.

EXTENSION ACTIVITIES

- Produce artwork using product.
- Design advertising and packaging for product.
- Identify other products for which charcoal is a raw material. Use of product in another Design and Make Activity. (See "A Sticky Business".)

KEY EXPERIENCES

Through following the Student Activity Sheet provided, pupils will develop knowledge and understanding about:

- how products are manufactured from raw materials;
- the importance of using materials from renewable sources;

and develop skills and strategies in:

- small scale production of charcoal;
- quality control procedures;
- packaging techniques;
- evaluation of products;
- costing materials, time and production process.

KEY VOCABULARY

- Heath and Safety
- Aerobic and anaerobic combustion
- Bath production
- Small scale production plant

RESOURCES

- Tools and equipment needed for charcoal making
- Examples of charcoal products
- Heath and Safety information
- Raw materials
- Sources of information on charcoal production
- Student Activity Sheet

RELEVANT WEB SITES

Charcoal Burning - <http://www.regia.org/charcoal.htm>

The Skinny on....Charcoal -
<http://www.discovery.com/area/skinnyon/skinnyon980123/skinnyon.html>

How Stuff Works - <http://www.howstuffworks.com/question209.htm>

MANAGEMENT AND ORGANISATION OF LEARNING PROGRAMME AND STUDY FOCUS

Designing skills:

- identify appropriate sources of information;
- use design briefs to guide design thinking;
- consider needs and values of intended users;
- consider the function of their designs;
- take account of characteristics and properties of materials when choosing them;
- prioritise and reconcile decisions on materials, production, time and costs within the proposals;
- take account of limitations presented by tools and equipment;
- explore, develop and communicate design ideas by modelling ideas including use of IT;
- develop a clear idea and propose an outline plan, with alternative procedures if needed;
- evaluate designs and indicate ways of improving their ideas.

Making skills:

- select materials, tools and equipment appropriate to task;
- make products in quantity, using techniques to ensure consistency;
- evaluate designs, testing performance against criteria;
- implement improvements identified and take on-going action to ensure products meet specifications and original intentions.

KNOWLEDGE AND UNDERSTANDING

Materials and components:

Pupils should be taught:

- to consider physical and chemical properties and relate these to the way materials are worked and used;
- that materials can be classified according to properties and behaviour;
- that materials can be combined, processed and finished in order to create more useful properties and desired aesthetic effects.

Products and applications - re:

- their intended purpose;
- the choice of materials and ways in which they have been used;
- the processes used to produce them;
- the scientific principles applied;
- the views of users and manufacturers;
- a range of alternative products.

Quality - identify and use criteria - re:

- how far it meets a clear need;
- its fitness for purpose;
- whether it is an appropriate use of resources;
- its impact beyond the purpose for which it was designed.

Health and Safety - re:

- taking responsibility for recognising hazards in a range of products, activities and environments with which they are familiar;
- using appropriate information sources to assess the risks, both immediate and cumulative;
- applying their knowledge and taking action to control the risks to themselves and to others.

OPPORTUNITIES FOR IT

- DTP for packaging and advertising materials
- DTP for evaluation report
- Graphics for packaging and advertising

CURRICULUM LINKS

- Business Education - costing, promotion and advertising.
- Science - chemical properties of wood/charcoal, combustion and heat exchange.
- Art - product manufacture and use.
- Geography - use of natural materials from renewable source.

ASSESSMENT

When pupils are designing and making, consider to what extent they are:

- gathering information independently to help generate design ideas;
- developing criteria for their design, taking into account function and the purpose for which it is intended;
- investigating form, function and production processes;
- taking account of the working characteristics of materials and components;
- evaluating their work as it develops;
- taking account of constraints;
- producing plans and outlining time and resource use;
- adapting production methods and design ideas in response to circumstance;
- using appropriate techniques to evaluate their work and suggest modifications.



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Design & Technology

Fencing the Woodland Way

The design of enclosures varies considerably throughout the British Isles. Local styles evolved as a result of available materials and inherited building techniques. In this activity the importance of function is considered and how a design may be proposed which uses natural materials.

THE CONTEXT

The context focuses upon the home production of a commercially available product using traditional methods.

THE ACTIVITY

This focuses on the manufacture of a prototype using natural materials from a renewable source.

STARTING POINTS/STIMULI

- Using a visit to a garden centre, catalogues and photographs to show the different types of fencing available.

FOCUSED PRACTICAL TASKS

- Demonstrate and practice weaving techniques.
- Demonstrate accurate measuring.
- Identify and evaluate appropriate raw materials.

DESIGN AND MAKE ASSIGNMENTS

- Design and make a fencing panel from natural, raw materials which could be used to fence a garden or school grounds.
- Using models, design and make a variety of fencing panels for use in a garden.
- Evaluate needs of users of your product and adapt to satisfy requirements.
- Evaluate your product and adapt it to allow multiple panels to be carried.

INVESTIGATION, DISASSEMBLY AND EVALUATION ACTIVITIES

- Evaluate the fencing available and consider how well it performs its function.
- Discuss all the criteria which their product needs to satisfy.
- Look at construction techniques used.
- Identify the raw materials used in construction.
- Examine the practicality of different types of fencing when it comes to transporting and construction of lengths of fencing on site.

EXTENSION ACTIVITIES

- Discuss advantages of different types of fencing, for example:
 - ◇ Why do the designs of stock enclosures appear different in different parts of the country?
 - ◇ What else can some structures offer beside keeping stock in/out?
- Investigate other uses for different fencing structures.

KEY EXPERIENCES

Through following the Student Activity Sheet, pupils will have developed knowledge and understanding about:

- the importance of considering the function of their design;
- components and processes used to produce commercial products;
- use of specialist tools;
- using raw materials from renewable sources;

and developing skills and strategies in:

- construction techniques, including joining components together;
- selecting appropriate materials and equipment;
- quality control procedures;
- safe manufacturing procedures;
- evaluation of products;
- costing materials, time and production process.

KEY VOCABULARY

- Traditional techniques.
- Weaving.
- Aesthetics.
- Scale model.

RESOURCES

- Tools and equipment needed for hurdle making.
- Examples of fencing products and fastenings.
- Raw materials.
- Sources of information on fence production.
- Student Activity Sheet

RELEVANT WEB SITES

English Hurdle - www.hurdle.co.uk/

Thatch International Ltd - www.thatch.co.uk

The Dry Stone Walling Association of Great Britain - www.dswa.org.uk/gallery_frames.htm

The National Hedgelaying Society - <http://members.tripod.co.uk/hedgelaying/>

MANAGEMENT AND ORGANISATION OF LEARNING PROGRAMME AND STUDY FOCUS

Designing skills:

- identify appropriate sources of information;
- use design briefs to guide design thinking;
- develop specification for product;
- consider needs and values of intended users;
- generate design proposals that match stated design criteria;
- consider the aesthetics, function, safety, reliability of their designs;
- take account of characteristics and properties of materials when choosing them;
- prioritise and reconcile decisions on materials, production, time and costs within the proposals;
- take account of limitations presented by tools and equipment;

- explore, develop and communicate design ideas by modelling ideas, including use of IT;
- develop a clear idea and propose an outline plan, with alternative procedures if needed;
- evaluate designs and indicate ways of improving their ideas.

Making skills:

- select materials, tools and equipment appropriate to task;
- select and use appropriate methods of shaping and forming materials accurately;
- join and combine additional materials in temporary and permanent ways;
- interconnect a variety of components to achieve functional results;
- apply a range of appropriate finishing techniques;
- evaluate designs, testing performance against criteria;
- implement improvements identified and take on-going action to ensure products meet specifications and original intentions.

KNOWLEDGE AND UNDERSTANDING

Materials and components:

Pupils should be taught:

- to consider physical properties and relate these to the way materials are worked and used;
- that materials can be classified according to properties and behaviour;
- that materials can be combined, processed and finished in order to create more useful properties and desired aesthetic effects.

Structures

- to recognise and use structures in their products;
- that excessive loads can cause structures to fail by bending, buckling and twisting.

Products and application - re:

- their intended purpose;
- the choice of materials and ways in which they have been used;
- the processes used to produce them;

- the scientific principles applied;
- the views of users and manufacturers;
- a range of alternative products.

Quality - identify and use criteria - re:

- how far it meets a clear need;
- its fitness for purpose;
- whether it is an appropriate use of resources.
- its impact beyond the purpose for which it was designed.

Health and Safety - re:

- taking responsibility for recognising hazards in a range of products, activities and environments with which they are familiar.

OPPORTUNITIES FOR IT

- Modelling

CURRICULUM LINKS

- Business Education - costing, promotion and advertising.
- Science - structural properties of wood.
- Geography - use of natural materials from renewable source.

ASSESSMENT

When pupils are designing and making, to what extent are they:

- gathering information independently to help generate design ideas;
- developing criteria for their design, taking into account appearance, function, safety, reliability and the purpose for which it is intended;
- investigating form, function and production processes;
- recognising user preferences;
- taking account of the working characteristics of materials and components;
- evaluating their work as it develops;
- using 3D models to explore and test their design ideas;

- using sketches and models to illustrate alternatives;
- taking account of constraints;
- producing a step-by-step plan to assist in making;
- producing plans and outlining time and resource use;
- using methods to measure, mark and cut appropriate materials with accuracy;
- paying attention to quality of finish and the function of the idea;
- adapting production methods and design ideas in response to circumstances;
- using appropriate techniques to evaluate their work and suggesting modifications.



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Design & Technology

From Fleece to Fabric

As our society becomes more urbanised and dislocated from natural processes, it is important that people make clear associations between the product and its source. In this activity, students process a sheep's fleece from its natural state into a usable piece of fabric, through the stages of carding, spinning, dyeing and weaving.

THE CONTEXT

The context focuses on turning a fleece into a useable piece of fabric.

THE ACTIVITY

This focuses on the processes by which a fleece is made from fabric. Pupils will develop an understanding of the processes of carding, spinning, weaving and dyeing.

STARTING POINTS/STIMULI

- Show a video of commercial wool production processes, including dyeing
- Show a video of sheep shearing or observation of practical activity
- Use of the CD-ROM for information.

FOCUSED PRACTICAL TASKS

- Demonstrate carding, combining, spinning and weaving.
- Demonstrate dyeing techniques.

DESIGN AND MAKE ASSIGNMENTS

- Make a piece of woollen fabric.
- Decide on how this can be used.

INVESTIGATION, DISASSEMBLY AND EVALUATION ACTIVITIES

- Evaluate the differences between hand produced product and commercially produced product.
- Investigate a range of woollen materials to determine how colour and pattern are added.

EXTENSION ACTIVITIES

- Test for colour fastness.
- Cost of wool production.
- Types of wool suitable for different uses, e.g. clothing, upholstery.
- Types of sheep.
- Natural and synthetic dyes.

KEY EXPERIENCES

Pupils following the Student Activity Sheet will develop knowledge about:

- how wool is processed;
- how colour can be applied to fabrics;
- type of dye available;
- spinning wool;
- weaving - mechanical and hand produced.

KEY VOCABULARY - See Student Activity Sheet

RESOURCES

- Fleece
- Cards
- Combs
- Spindle
- Loom
- Spinning wheel
- Dyes - natural and synthetic
- Equipment for dyeing
- Student Activity Sheet

RELEVANT WEB SITES

British Wool Marketing Board - <http://www.britishwool.org.uk>

Wool - <http://library.thinkquest.org/C004179/wool.htm>

Wool making - <http://salemhistory.org/places/pmm003.htm>

MANAGEMENT AND ORGANISATION OF LEARNING PROGRAMME AND STUDY

Making Skills

- select materials, tools and equipment appropriate to task.
- select and use appropriate methods of shaping and forming materials accurately.
- join and combine additional materials in temporary and permanent ways.
- evaluate designs, testing performance against criteria.

KNOWLEDGE AND UNDERSTANDING

Materials and Components

Pupils should be taught:

- to consider physical properties and relate these to the way materials are worked and used;
- that materials can be classified according to properties and behaviour;
- that materials can be combined, processed and finished in order to create more useful properties and desired aesthetic effects.

Products and applications - re:

- the processes used to produce them;
- the scientific principles applied;
- the views of users and manufacturers;
- a range of alternative products.

Quality -Identify and use criteria - re:

- taking responsibility for recognising hazards in a range of products, activities and environments with which they are familiar;
- assessing risks;
- taking action to control risks.

OPPORTUNITIES FOR IT

- DTP - for production or quality control report
- Graphics - for designing colours for weaving
- CD-ROM for information on dyes

CURRICULUM LINKS

- Art - colour
- Science - dyes
- Economic and Industrial awareness

ASSESSMENT

- When pupils are designing and making, consider to what extent they are:
- considering the views and prejudices of different user groups;
- gathering, recording and using information gained by a variety of evaluation and investigation techniques;
- drawing on knowledge and understanding of existing products;
- paying attention to the quality of finish and acceptability to the client;
- developing practical skills



Teacher Guide Notes - A Case for the Countryside

Design & Technology

H2O Flow

Water is one of the few essential requirements of living things and is also an important requirement of many manufacturing industries. The large demand for water causes it to be of great value and therefore its control is very important. In the countryside vast amounts of water are used for irrigation and in this activity the student is asked to design a measuring device which will control the amount of water delivered by an irrigation system.

THE CONTEXT

The context focuses on controlling the growing environment of plants in the garden or field.

THE ACTIVITY

The design and production of a measuring device which will control the amount of water delivered by an irrigation system.

STARTING POINTS/STIMULI

- Use the section in the video showing large scale irrigation system.
- Visit a garden centre.
- Provide catalogues of garden and industrial watering devices.

FOCUSED PRACTICAL TASKS

- Produce a circuit using a PCB or alternative.
- Select and solder components.

DESIGN AND MAKE ASSIGNMENTS

- Design and make a device to monitor and control the amount of water delivered by a watering mechanism in an appropriate growing environment.
- Build a suitable housing for the device to enable it to operate in all weathers in that environment.

INVESTIGATION, DISASSEMBLY AND EVALUATION ACTIVITIES

- Investigate simple electronic systems and sensing devices.
- Examine different circuit production methods.
- Examine different fluid flow control devices.

EXTENSION ACTIVITIES

- Develop input/output systems.
- Develop a logging system to record the daily amount of water supplies.

KEY EXPERIENCES

Pupils completing this activity will develop knowledge and understanding about:

- structures - their construction, forces and components within a structure;
- control systems - use of interface/buffer box and software (input/output devices and sensors);
- mechanisms and their application (pulleys, levers, linkages, gears);

and develop skills and strategies in:

- construction of structures, use of appropriate materials, joining methods and fasteners/adhesives;
- use and assembly of components - both mechanical and electronic devices for application to context;
- system and control through a computer interface.

KEY VOCABULARY

- Interface
- Feedback
- Data logging

RESOURCES

- Electronic wire, PCB (or similar)
- Sensors (micro switches, moisture sensors)
- Transducers (motors, motorised valves)
- Construction materials for structures (wood, metal rod, plastic sheet)
- Mechanism components - cams, gears, axles, shafts, pulley cranks, gear boxes
- Kits for modelling above
- Interface for computer and relevant software

RELEVANT WEB SITES

Watermatic - www.watermaticltd.co.uk

Norman Garden Products - www.norman-garden-products.co.uk/default.htm

Jones Engineering - <http://www.jonesengineering.co.uk/irrigation.html>

MANAGEMENT AND ORGANISATION OF LEARNING PROGRAMME AND STUDY FOCUS

Designing skills:

- identify appropriate sources of information
- use design briefs to guide design thinking;
- develop specification for product;
- consider needs and values of intended users;
- generate and modify proposals;
- consider the aesthetics, function, safety, reliability of their designs;
- take account of characteristics and properties of materials when choosing them;
- take account of limitations presented by tools and equipment;
- model ideas;
- develop a clear idea and propose an outline plan, with alternative procedures if needed;
- evaluate designs and indicate ways of improving their ideas.

Making skills:

- select materials, tools and equipment appropriate to task;
- choose and use appropriate methods;
- join and combine additional materials in temporary and permanent ways;
- apply a range of appropriate finishing techniques;

- make products in quantity, using techniques to ensure consistency;
- evaluate designs, testing performance against criteria;
- implement improvements identified and take on-going action to ensure products meet specifications and original intentions.

KNOWLEDGE AND UNDERSTANDING

Materials and components

Pupils should be taught:

- to consider physical properties and relate these to the way materials are worked and used;
- that materials can be classified according to properties and behaviour;
- that materials can be combined, processed and finished in order to create more useful properties and desired aesthetic effects.

Systems and control:

- to design, use and interconnect simple systems and sub-systems;
- how to interconnect mechanisms to achieve different kinds of movement;
- to use electrical switches to control devices;
- to use sensors in switching circuits;
- that systems have inputs, processes and outputs;
- the importance of feedback;
- to analyse performance of systems to check effective wiring.

Structures:

- to recognise and use structures in their products;
- that excessive loads can cause structures to fail by bending, buckling and twisting.

Products and applications - re:

- their intended purpose;
- the choice of materials and ways in which they have been used;
- the processes used to produce them;
- the scientific principles applied;
- the views of users and manufacturers;
- a range of alternative products.

Quality - identify and use criteria - re:

- how far it meets a clear need;
- its fitness for purpose;
- whether it is an appropriate use of resources;
- its impact beyond the purpose for which it was designed.

Health and Safety - re:

- taking responsibility for recognising hazards in a range of products, activities and environments with which they are familiar;
- applying their knowledge and taking action to control the risks to themselves and to others.

OPPORTUNITIES FOR IT

- CAD for PCB/Housing
- Data collection
- Feedback and control

CURRICULUM LINKS

- Science - biological, electronics
- IT - modelling and control, data logging
- Geography - environmental/earth sciences

ASSESSMENT

When pupils are designing and making, consider to what extent they are:

- gathering information independently to help generate design ideas;
- modelling to test and explore;
- using formal drawing methods to communicate design intentions;
- developing criteria for their design, taking into account appearance, function, safety, reliability and the purpose for which it is intended;
- taking account of the working characteristics of materials and components;
- adapting production methods and design ideas in response to circumstances;

- evaluating their work as it develops;
- using appropriate techniques to evaluate their work and suggest modifications



Teacher Guide Notes - A Case for the Countryside

Design & Technology

Say "Cheese"

Cheese was originally discovered by Arabs storing milk in pouches made from goat stomach linings, where rennet in the lining reacted with the milk to form a basic cheese. Cheese making has been a traditional countryside activity for centuries. In this activity students produce their own cheese, discovering what is involved with small scale manufacture and compare results with commercially available cheeses, investigating how various effects have been achieved.

THE CONTEXT

The context focuses on the home production of a commercially available product.

THE ACTIVITY

This focuses on the production of cheese and the comparison with different types of its commercially produced alternative.

STARTING POINTS/STIMULI

- Show a video of commercial cheese production
- Have a tasting session of English and foreign cheeses.
- Show a video of local cheese making.
- Give a demonstration and have a group of cheese-making exercises.

FOCUSED PRACTICAL TASKS

- Working in groups, produce different types of cheese by using different milk, e.g. goats, soya.
- Working in groups, produce different types of cheese by adding flavours - herbs, garlic etc.
- Evaluate the products against commercially produced cheeses.

DESIGN AND MAKE ASSIGNMENTS

- Design and make different cheeses.
- Consider how this cheese could be packaged and advertised.

INVESTIGATION, DISASSEMBLY AND EVALUATION ACTIVITIES

- Through sensory evaluation, examine a range of cheeses.
- Use information given on labels and tasting experience to work out how they have been produced and how ingredients, colours, textures and flavours have been combined for particular effects.
- Look at brands and types which prove popular in the class - consider why they are popular.

EXTENSION ACTIVITIES

- Produce a display of cheese producing areas in the British Isles.
- Regional cheeses - EEC Regulations.
- Survey preferences of cheese.
- Investigate biotechnology in cheese and other products, i.e. how do they get the veins in blue cheeses.
- Design a package for the home produced cheese.
- Design a poster advertising the cheese.

KEY EXPERIENCES

Through completing this activity using the Student Activity Sheet, pupils will develop knowledge and understanding about:

- aspects of food science and their application;
- planning and organising themselves and others when working in groups;
- the nutritional values of dairy products;
- an understanding of how food products are manufactured from raw material;

and develop skills/strategies in:

- small scale production of cheese;
- quality control procedures;
- packaging techniques;
- safe hygiene practices;
- evaluation of products;
- costing ingredients, time and production processes.

KEY VOCABULARY

- Biotechnology
- Curds
- Micro-bacteria
- Whey
- Cultures
- Pasteurisation
- Food safety and hygiene
- Pressing
- Quality control
- Moulding
- Moulds
- Ripening
- Rennet

RESOURCES

- Tools and equipment needed for cheese making
- Examples of cheeses
- Food safety and hygiene information
- Ingredients and equipment to make cheese
- Sources of information on cheese production
- Student Activity Sheet

RELEVANT WEB SITES

Directory on cheese making, cheeses sellers, cheese types etc -
<http://dmoz.org/Recreation/Food/Cheese/>

MANAGEMENT AND ORGANISATION OF LEARNING PROGRAMME AND STUDY FOCUS

Designing skills:

- identify appropriate sources of information;
- consider needs and values of intended users;
- take account of characteristics and properties of materials when choosing them;
- evaluate design and indicate ways of improving their ideas.

Making skills:

- use a range of processes to shape and form material;
- select materials, tools and equipment appropriate to task;
- select and use appropriate methods of shaping and forming materials accurately;
- join and combine additional materials in temporary and permanent ways;
- develop a clear idea and propose an outline plan;
- evaluate designs, testing performance against criteria.

KNOWLEDGE AND UNDERSTANDING

Materials and components

Pupils should be taught:

- to consider physical and chemical properties of materials;
- that materials can be combined and processed;
- that heat treatment and the combining of materials alter work and performance characteristics.

Products and applications - re:

- their intended purpose;
- the choice of materials and ways in which they have been used;
- the views of users and manufacturers.

Quality - identify and use criteria - re:

- how far it meets a clear need;
- its fitness for purpose;
- whether it is an appropriate use of resources.

Health and Safety - re:

- taking responsibility for recognising hazards in a range of products, activities and environments;
- using appropriate information to assess risks;
- applying their knowledge and taking action to control risks.

OPPORTUNITIES FOR IT

- DTP - for production or quality control report.
- DTP - for packaging and advertising materials.
- Graphics - for packaging.
- Database - nutritional analysis.

CURRICULUM LINKS

- Business Education - costing, promotion and advertising.
- Science - chemical properties of milk products, bio-chemistry.

ASSESSMENT

When pupils are designing and making, consider to what extent they are:

- recognising that others have views and preferences;
- able to draw upon the knowledge and understanding learned and make value judgements about:
 - the food ingredients which may be produced;
 - the methods and techniques needed;
 - developing criteria against which to evaluate their ideas;
 - producing and following coherent step-by-step plans to help identify the main stages in trialing and production of the product;
 - paying attention to the quality of finish and acceptability to the client;
 - developing practical skills.



Teacher Guide Notes - A Case for the Countryside

Design & Technology

Where there's Dough

The average family's association with bread has changed from the weekly ritual of baking bread for the rest of the week, to the weekly ritual of taking bread off the supermarket shelves. As so many different people buy bread from the supermarket, each of whom have different tastes, the supermarket bakers have to decide what type of bread to bake, how much of each type and how much they can charge for it. In this activity students have to simulate this task by researching, designing, manufacturing, packaging and costing a product to suit market tastes.

THE CONTEXT

The context focuses on breadmaking and variations of yeast mixtures, comparing it with the commercially available product.

THE ACTIVITY

This activity focuses on the design and production of bread and yeast mixtures.

STARTING POINTS/STIMULI

- Show a video of commercial bread production.
- Visit a local bakery or supermarket in-store bakery.
- Use articles on breadmaking and yeast mixtures from magazines.

FOCUSED PRACTICAL TASKS

- Work in groups to produce homemade bread and yeast mixtures and compare with commercially produced products.
- Compare and evaluate ease of making, cost, appearance, taste.
- Evaluate their finished product.
- Compare different methods of breadmaking at home, e.g. use of Vitamin C to speed up the process, different types of yeast, different types of flour etc.

DESIGN AND MAKE ASSIGNMENTS

- Consider how the bread could be packaged and advertised as a mini enterprise.
- Consider uses of different shapes of bread, e.g. sliced, buns etc.

INVESTIGATION, DISASSEMBLY AND EVALUATION ACTIVITIES

- Set up a tasting session to compare homemade and commercially available products.
- Use information available to compare nutritional value.
- Calculate and compare the cost of the products.

EXTENSION ACTIVITIES

- Compare the in-store bakery and the independent baker.
- Talk to parents and grandparents about making bread - how it was done without modern facilities.
- Investigate the history of breadmaking.
- Look at different shapes of bread and use of different methods of shaping, e.g. cooking in a plant pot.
- Investigate bread from different countries, e.g. soda bread, naan bread, cornbread.

KEY EXPERIENCES

Pupils completing the Student Activity Sheet will develop knowledge and understanding about:

- designing - for the user and according to market tastes;
- planning and organising themselves into groups;
- quality assurance procedures;
- materials - methods of food preparation and processing, using the properties of materials, learning from studying industrial practices, effect of heat treatment (methods of baking);
- aspects of food science and their application;
- developing criteria against which to evaluate the products;
- the nutritional value of bread;

and develop skills/strategies in:

- weighing and measuring dry and liquid ingredients;
- ways of combining different ingredients to achieve a particular outcome;
- methods of mixing, moulding, shaping;
- preference testing;
- hygienic and safe practices
- evaluation of the product;
- costing ingredients, time and production processes.

KEY VOCABULARY

- Biotechnology
- Fermentation
- Bread making terms - proving, kneading, sponging.

RESOURCES

- Magazine cuttings - different recipes for bread and yeast mixtures
- Samples of bread and yeast mixtures from a supermarket, local bakery, etc.
- Types of yeast
- Types of flour
- Recipe sheets with basic recipe
- Ingredients for bread making
- Student Activity Sheet

RELEVANT WEB SITES

The mysteries of bread making -

<http://www.ifrn.bbsrc.ac.uk/public/FoodInfoSheets/EDPBread.html>

Bringing Baking to Life - Guidance for Teachers -

http://www.foodforum.org.uk/curriculum/Baking_Teacher_Guidance.shtml

MANAGEMENT AND ORGANISATION OF LEARNING PROGRAMME AND STUDY FOCUS

Designing Skills:

- identify appropriate sources of information;
- consider needs and values of intended users;
- take account of characteristics and properties of materials when choosing them;
- evaluate designs and indicate ways of improving their ideas.

Making Skills:

- use a range of processes to shape and form materials;
- select tools, equipment and materials appropriate to task;
- select and use appropriate methods;
- join and combine additional materials in temporary and permanent ways;
- interconnect a variety of components to achieve functional results;
- evaluate designs, testing performance against criteria.

KNOWLEDGE AND UNDERSTANDING

Materials and Components

Pupils should be taught:

- to consider physical and chemical properties of materials and relate these to the way materials are worked and used;
- to combine and process materials in order to create more useful properties;
- that heat treatment alters characteristics.

Products and Applications - re:

- their intended purpose;
- the choice of materials and ways in which they have been used;
- the processes used to produce them;
- the scientific principles applied;
- the views of users and manufacturers;
- a range of alternative products.

Quality - identify and use criteria - re:

- meeting needs;
- fitness for purpose.

Health and Safety - re:

- taking responsibility for recognising hazards in products, activities and environments;
- using appropriate information to assess risks;
- applying their knowledge and taking action to control risks.

OPPORTUNITIES FOR IT

- Spreadsheets to calculate costs, nutritional value, etc.
- Use of nutritional analysis programme;
- CD-ROM - information on yeast and flour.

CURRICULUM LINKS

- Business Studies - cost of production, advertising, marketing.
- Mathematics - ratios, proportions, weighing, measuring.
- Humanities - cereal crops, agriculture.
- Science - nutrition, properties of materials.

ASSESSMENT

When pupils are designing and making, consider to what extent they are:

- considering views and preferences of different user groups;
- gathering, recording and using information;
- drawing knowledge and understanding of existing products;
- development practical skills.



Teacher Guide Notes - A Case for the Countryside

Design & Technology

Whirring Worzel

The scarecrow is a popular image of the countryside but, for the farmer, effectiveness is of more use than aesthetics. In this activity students can apply their ingenuity to the problem of scaring birds electronically, using a moving device.

THE CONTEXT

The context focuses on keeping birds off crops.

THE ACTIVITY

The design and production of a moving device which will scare birds.

STARTING POINTS/STIMULI

- Visiting a farm - <http://www.farmsforschools.org.uk>
- Visiting/talking to airport/RAF runway personnel.
- Worzel Gummage!

FOCUSED PRACTICAL TASKS

- Use kits to investigate gears, levers and pulleys.

DESIGN AND MAKE ASSIGNMENTS

- Design and make a moving bird scaring device which will operate randomly throughout the day.
- Build a suitable housing for the power source to enable it to operate in all weathers in that environment.

INVESTIGATION, DISASSEMBLY AND EVALUATION ACTIVITIES

- Investigate simple electronic timing systems.
- Examine different circuit production methods.

EXTENSION ACTIVITIES

- Extend the control system to turn the device off at night.
- Develop a sound system.
- Design an all weather casing for the power source (12v battery).

KEY EXPERIENCES

Pupils, through completing this activity, will develop knowledge and understanding about:

- timing circuits;
- motors, gear boxes, gear trains, pulleys, levers, linkages, gears;
- and develop skills and strategies in:
- construction of structures, use of appropriate materials, joining methods and fasteners/adhesives;
- use and assembly of components - both mechanical and electronic devices for application to context;
- combining the effect of various mechanisms to build a device with a single purpose;
- designing, making and assembling a PCB.

KEY VOCABULARY

- Mechanisms
- Circuit production

RESOURCES

- Electronic wire, PCB (or similar)
- Sensors (micro switches, light sensors)
- Transducers (motors)
- Construction materials for structures (wood, metal rod, plastic sheet)
- Selection of fabric materials for covering mechanism

- Mechanism components - cams, gears, sprockets, axles, shafts, pulley cranks, gear boxes, string, wire, chain
- Kits for modelling above

RELEVANT WEB SITES

Dedger Bird Scarer - <http://www.deger.com.tr/bomb/>

Scarey Man - <http://www.clarratts.com>

Bird Scarers - <http://www.martleyelectronics.co.uk/birdscarers.html>

Environmental Protection -

<http://www.newarksherwooddc.gov.uk/environmentalservices/environmentalprotection/>

[birdscare.htm"](http://www.newarksherwooddc.gov.uk/environmentalservices/environmentalprotection/birdscare.htm)

MANAGEMENT AND ORGANISATION OF LEARNING PROGRAMME AND STUDY FOCUS

Designing Skills:

- identify appropriate sources of information;
- develop specification for product;
- generate and modify proposals;
- consider the aesthetics, function, safety, reliability of their designs;
- take account of characteristics and properties of materials when choosing them;
- take account of limitations presented by tools and equipment;
- model ideas;
- develop a clear idea and propose an outline plan, with alternative procedures if needed;
- evaluate designs and indicate ways of improving their ideas.

Making Skills:

- select materials, tools and equipment appropriate to task;
- choose and use appropriate methods;
- join and combine additional materials in temporary and permanent ways;
- use kits to simulate and test ideas;
- evaluate designs, testing performance and against criteria;
- implement improvements identified and take on-going action to ensure products meet specifications and original intentions.

KNOWLEDGE AND UNDERSTANDING

Systems and Control:

Pupils should be taught:

- to design, use and interconnect simple systems and sub-systems;
- how to interconnect mechanisms;
- to use electrical switches to control devices;
- that systems have inputs, processes and outputs;
- to analyse performance of systems.

Production and Applications - re:

- their intended purpose;
- the choice of materials and ways in which they have been used;
- the scientific principles applied.

Quality - Identify and use criteria - re:

- how far it meets a clear need;
- its fitness for purpose;
- whether it is an appropriate use of resources;
- its impact beyond the purpose for which it was designed.

Health and Safety - re:

- taking responsibility for recognising hazards in a range of products, activities and environments with which they are familiar;
- applying their knowledge and take action to control the risks to themselves and to others.

OPPORTUNITIES FOR IT

- CAD for PCB/housing

CURRICULUM LINKS

- Science/physics - gears, pulleys, levers, motors, electronics
- Art - colour, design

ASSESSMENT

When pupils are designing and making, consider to what extent they are:

- gathering information independently to help generate design ideas;
- modelling to test and explore;
- developing criteria for their design, taking into account appearance, function, safety, reliability and the purpose for which it is intended;
- taking account of the working characteristics of materials and components;
- adapting production methods and design ideas in response to circumstances;
- evaluating their work as it develops;
- using appropriate techniques to evaluate their work and suggest modification.



**Teacher Guide Notes -
A Case for the Countryside**

Design & Technology

Signs of the Times

We encounter all kinds of signs every day, from the road signs on the way to school in the morning to the name plate on the toilet door. Imagine the plight of someone who came into a building looking for a particular office, where there were no signs and nobody to ask. The only possible course of action would be to check each and every door. The same problem exists in the countryside where visitors are unsure whether they can use certain paths and do not necessarily know how to get where they want to go. A well distributed, clear and succinct sign system can alleviate many of these problems. In this activity students design the means by which helpful information can be provided for visitors to tourist spots.

THE CONTEXT

The context focuses on the need to provide the public with helpful information about the tourist spots they visit.

THE ACTIVITY

This focuses on the design and production of an interpretation board in a tourist/visitor location.

STARTING POINTS/STIMULI

- Consider the plight of a person visiting for the first time and trying to find a particular building/room/feature (perhaps starting with the school!).
- Observe and evaluate existing signing systems and identify good/bad practice and efficiency/functionality.

FOCUSED PRACTICAL TASKS

- Design and lay out text and symbols with CAD and computer paint/DTP packages.
- Vacuum form lettering or tactile maps for the visually impaired.
- Carve letters and shapes.
- Forge frames, lettering and indicators.
- Engrave test symbols on plastics, laminates and metals.

- Demonstrate and practise using a powered fretsaw for the cutting of woods and metals.
- Extend the use of hand tools.
- Use CAD/CAM.

DESIGN AND MAKE ASSIGNMENTS

- Design and make a sign or piece of information graphics for a specific location.
- The task could incorporate batch production as a team activity.
- Design and make an illuminated interpretation board. Can sound commentaries be added to at least prototype stage?

INVESTIGATION, DISASSEMBLY AND EVALUATION ACTIVITIES

- Through discussion, identify a need for signing/interpretation in a rural setting (e.g. park, farm, beauty spot, footpath, bridleway, other tourist attraction).
- Investigate types and forms of signing already in school or the direct locality.
- Evaluate the effectiveness of examples observed.
- Evaluate production methods and materials.

EXTENSION ACTIVITIES

- Identify a client for whom the project is relevant and could set a real problem for students' work and use them as an evaluator.
- Design and build an illuminated 'You are Here' type interpretation board which indicates features.
- Investigate the addition of sound and perhaps commentary via devices such as CD-ROM.

KEY EXPERIENCES

- Pupils, through completing this activity, will develop knowledge and understanding about:
- investigating and evaluating familiar products;
- communication systems - texts/fonts, informational, directional and locational graphics;
- batch production methods;
- CAD/CAM applications to produce repeat items of quality;
- production methods/materials;

and develop skills/strategies in:

- sign production methods (batch production, repeatability);
- working materials, selection of process;
- graphic/communication skills;
- evaluating skills;
- working in teams.

KEY VOCABULARY

- Batch production
- Jigs/formers
- Graphics terminology

RESOURCES

- Plastic
- Hardwood (for engraving)
- Steel bar/rod (forge work)
- Carving tools/chisels
- Powered fret saw
- Vacuum former
- Thermo forming equipment
- Plastic film (or cutter plotter)
- Graphics equipment
- CNC mill/engraver
- CAD/CAM equipment
- Plotter/cutter plotter
- Stika scan

RELEVANT WEB SITES

Understanding mapping – in the Education section of the Ordnance Survey website - <http://www.ordsvy.gov.uk/>

Signs by Nature - <http://www.signsbynature.co.uk>

MANAGEMENT AND ORGANISATION OF LEARNING PROGRAMME AND STUDY FOCUS

Designing skills:

- identify appropriate sources of information
- develop design specification;
- develop a clear ideas of what has to be done and propose an outline plan;
- evaluate designs and indicate ways of improving their ideas.

Making skills:

- select materials, tools and equipment appropriate to task;
- choose and use appropriate methods;
- apply a range of finishing techniques;
- make products in quantity, using techniques to ensure consistency;
- develop strategies for making;
- implement improvements identified and take on-going action to ensure products meet specifications and original intentions.

KNOWLEDGE AND UNDERSTANDING

Materials and components

Pupils should be taught:

- to consider physical and chemical properties and relate these to the way materials are worked and used;
- that materials can be classified according to properties and behaviour.

Products and applications - re:

- their intended purpose;
- the choice of materials and ways in which they have been used;
- the processes used to produce them;
- the scientific principles applied;
- the views of users and manufacturers.

Quality - identify and use criteria - re:

- how far it meets a clear need;
- its fitness for purpose;

- whether it is an appropriate use of resources;
- its impact beyond the purpose for which it was designed.

Health and safety - re:

- taking responsibility for recognising hazards in a range of products, activities and environments with which they are familiar;
- using appropriate information sources to assess the risks, both immediate and cumulative;
- applying their knowledge and taking action to control the risks to themselves and to others.

OPPORTUNITIES FOR IT

- CAD/CAM engraving/milling, cutter/scanner, stencil production and mould production.
- DTP/Art package - for lettering and designs.
- Database - costing batch costs, materials' suitability.

CURRICULUM LINKS

- Business Education - costing, promotion and advertising.
- Art - styles, colour, fonts and formats.
- English - communication.
- Science - electrical circuits.

ASSESSMENT

When pupils are designing and making, consider to what extent they are:

- gathering information independently to help generate design ideas;
- developing criteria for their design, taking into account function and the purpose for which it is intended;
- investigating form, function and production processes;
- using formal drawing methods to communicate their intentions;
- taking account of the working, characteristics of materials and components;
- becoming increasingly skilful in the use of techniques, processes, tools

- and equipment;
- evaluating their work as it develops;
 - taking account of constraints;
 - adapting production methods and design ideas in response to circumstances;
 - using appropriate techniques to evaluate their work and suggest modifications.



**Teacher Guide Notes -
A Case for the Countryside**

Design & Technology

Be Seen, be Safe

Health and Safety Executive statistics show that not being clearly visible in a farming environment is a serious safety risk. Each year injuries occur as a result of machine operators being unaware of other people's presence. In this activity students are made aware of the dangers involved in farming and produce a garment which mitigates the risk of being unseen and also allows farm workers to carry out their job unimpeded by the garment.

THE CONTEXT

The context focuses on safety on the farm; in particular increasing the visibility of people on the farm.

THE ACTIVITY

The activity focuses on the design and production of a device to be worn for easy identification of an individual in a working environment on the farm.

STARTING POINTS/STIMULI

- Leaflets and warning posters.
- Artefacts.
- Farm safety video.
- Speakers - Health and Safety.
- Newspaper cuttings - accident reports.
- TV programmes.

FOCUSED PRACTICAL TASKS

- Discuss ways of evaluating design as well as the product.
- Demonstrate and practise threading a sewing machine, sewing straight lines and curves.
- Demonstrate and practise using fabric paints and pens.
- Demonstrate accurate measuring.

DESIGN AND MAKE ASSIGNMENTS

Design and make a safety accessory that would be worn by a farm worker.

INVESTIGATION, DISASSEMBLY AND EVALUATION ACTIVITIES

- Evaluate the safety accessories available and consider how well they do their job.
- Discuss how practical an item needs to be for it to be worn without hindering the wearer.
- Look at construction techniques and methods of fastening.

EXTENSION ACTIVITIES

- Discuss safety clothing used in school. What and why?
- Investigate other safety finishes applied to fabric, e.g. fireproofing.
- Design a poster to emphasise the importance of wearing safety clothing on the farm.
- Research other forms of protective clothing and their applications.

KEY EXPERIENCES

Pupils, through completing this activity, will develop knowledge and understanding about:

- developing criteria for their design against which evaluation can be made;
- the importance of considering the function of their design;
- components and processes that are used to produce commercial safety accessories;
- some of the special finishes applied to fabrics;
- using of a sewing machine;

and develop skills and strategies in:

- evaluating their ideas and product as it develops;
- selecting appropriate materials and equipment;
- joining fabrics together;
- using fabric paint and crayons;
- safe use of a sewing machine.

KEY VOCABULARY

- Aesthetics
- Reflective material
- Fabric properties
- Protection
- Identity
- Safety

RESOURCES

- Recent figures relating to farm accidents
- Luminous fabric paint
- Reflective fabrics
- Fastenings
- Paper, pens, pencils, etc
- Sewing equipment
- Sewing machine
- Student Activity Sheet

RELEVANT WEB SITES

Health and Safety - Agricultural Industry -

<http://www.hse.gov.uk/pubns/agindex.htm>

Field to Fork - Farm Safety -

http://www.countrysidefoundation.org.uk/GFG/Farming/Farmsafety/wholefarm_safety.htm

MANAGEMENT AND ORGANISATION OF LEARNING PROGRAMME AND STUDY FOCUS

Design skills:

- consider the needs and values of intended users;
- consider the aesthetics, function, safety, reliability and cost of designs;
- take account of properties of materials and components when deciding how to use them;
- evaluate design ideas.

Making skills:

- select tools, materials and equipment appropriate to the task;
- select and use appropriate methods;
- join and combine additional materials and components;
- develop an outline plan;
- apply a range of finishing techniques;
- evaluate products and test performance against criteria.

KNOWLEDGE AND UNDERSTANDING

Materials and components

Pupils should be taught:

- to consider the physical and chemical properties of materials;
- that materials can be combined, processed and finished to create more useful properties.

Products and applications - re:

- their intended purpose;
- choice of material and components;
- the processes used to produce them;
- scientific principles applied.

Quality - Identify and use criteria - re:

- how far it meets needs;
- its fitness for purpose.

Health and safety - re:

- taking responsibility for recognising hazards in a range of products, activities and environments;
- using appropriate information sources to assess risks;
- applying their knowledge and taking action to control risks.

OPPORTUNITIES FOR IT

- Database - research accident figures
- CD-ROM - newspaper abstracts on farm accidents

CURRICULUM LINKS

- Mathematics - measurement
- Science - properties of materials
- Art and Design - aesthetic awareness

ASSESSMENT

When pupils are designing and making, consider to what extent they are:

- using the information gained from their investigations to guide their design decisions;
- taking into account the views of others;
- setting their own criteria for evaluation;
- evaluating their work as it develops;
- using the sewing machine competently;
- considering the possible function when making decisions;
- developing practical tasks.



Teacher Guide Notes - A Case for the Countryside

Design & Technology

Built to Survive

Many young people in this age group participate in outdoor leisure pursuits and need to be prepared for any unexpected event by carrying an emergency kit. This activity encourages pupils to develop their own evaluative skills, particularly around existing products; from which new designs of their own may be generated and produced.

THE CONTEXT

The context focuses on the need for young people participating in outdoor leisure pursuits to be prepared for an unexpected experience by carrying an emergency kit.

THE ACTIVITY

The activity focuses on developing pupils' evaluative skills, particularly around existing products and from which new products may be generated.

STARTING POINTS/STIMULI

For a class/year group:

- experience a presentation by invited survival experts, e.g. Armed Services, Scouts, Emergency Services, local Outdoor Pursuits Clubs and Societies;
- focus on media reports of a suitable disaster;
- exhibition by camping shop.

In small groups:

- brainstorm the basic needs for which a pack would need to provide protection/relief;
- consider existing products on the market.

FOCUSED PRACTICAL TASKS

- Discuss ways of evaluating functionality as well as design.
- Demonstrate and practise threading a sewing machine, sewing straight lines and curves.

DESIGN AD MAKE ASSIGNMENTS

- Design and make a container to carry one emergency kit suitable for use by a young person of their age, who enjoys two contrasting leisure activities, e.g. walking and cycling; sailing and bird watching, fishing and golf. Pupils will need to consider not only the contents of such a kit, but how it is to be carried and the need to make it in a style which will encourage it to be carried.

INVESTIGATION, DISASSEMBLY AND EVALUATION ACTIVITIES

- Evaluate the safety accessory kits available and consider how well they do their job as well as their suitability for use in a variety of situations and their ease of carrying.
- Discuss in groups, what young people of this year/group's age would consider acceptable for use and draw up an agreed list of criteria against which to evaluate their product at a later stage.
- Look at construction techniques and methods of fastening.

EXTENSION ACTIVITIES

- What safety packs should be available in school; where should they be kept; how should they be accessed, and why?
- Investigate the safety needs of a very specialist kind of activity such as Antarctic exploration.
- Design safety posters to encourage young people to consider their safety requirements before undertaking outdoor leisure pursuits.

KEY EXPERIENCES

Pupils, through completing this activity, will develop knowledge and understanding about:

- developing criteria for their design against which evaluations can be made;
- the importance of considering aesthetic appeal as well as the function of their design;
- components and processes that are used to produce commercial safety products;
- some of the specialist fabrics available and the finish which can be applied to fabrics;
- use of a sewing machine;

and develop skills/strategies in:

- evaluating their idea and product as it develops;
- selecting appropriate materials and equipment;
- joining fabrics together;
- using a sewing machine.

KEY VOCABULARY

- Aesthetics
- Fabric Finishes
- Wear resistance

RESOURCES

- Links with relevant individuals and external agencies/organisation
- Selection of suitable fabrics
- Selection of fastenings - Velcro, buckles, studs
- General sewing equipment
- Paper, pencils, etc.

RELEVANT WEB SITES

Scouting Resources - <http://www.scoutingresources.org.uk>

The UK Survival School - <http://www.ukurvivalschool.co.uk>

Survival School - <http://www.survive-climate-change.co.uk>

Institute for Outdoor Learning - <http://www.outdoor-learning.org/intro.htm>

MANAGEMENT AND ORGANISATION OF LEARNING PROGRAMME AND STUDY FOCUS

Designing skills:

- consider the needs and values of intended users;
- generate design proposals that match criteria and modify them;
- consider the aesthetics, function, safety, reliability and cost of designs;
- take account of properties of materials and components when deciding how to use them;
- evaluate design ideas.

Making skills:

- join and combine additional materials and components;
- apply a range of finishing techniques;
- evaluate products and test performance against criteria.

KNOWLEDGE AND UNDERSTANDING

Materials and components

Pupils should be taught:

- to consider the physical and chemical properties of materials;
- that materials can be combined, processed and finished to create more useful properties;
- that heat treatment alters working and performance characteristics.

Products Application - re:

- their intended purpose;
- the choice of materials and components;
- the processes used to produce them;
- the scientific principles applied.

Quality - Identify and use criteria - re:

- how far it meets needs;
- its fitness for purpose.

Health and Safety - re:

- Using appropriate information to assess risks.

OPPORTUNITIES FOR IT

- CAD design of pattern
- Programmable sewing machine lettering and designs

CURRICULUM LINKS

- Science - properties of materials, nutrition, disease prevention, bodily systems
- Art and Design - aesthetic awareness
- Mathematics - measurement

ASSESSMENT

When pupils are designing and making, consider to what extent they are:

- using information gained from their investigations to guide their design decisions;
- using the sewing machine competently;
- consider the possible conflict between aesthetic appeal and function when making decisions;
- taking into account users' views;
- setting their own criteria for evaluation;
- evaluating their work as it develops.